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ABSTRACT

The old ways of doing things are no longer suitable to some of the current conditions faced by the world, such as overpopulation, environmental degradation, unstable economic development, and wasteful consumption of natural resources. In order to achieve a sustainable future, nations must develop better long range planning through combining economic, environmental, and demographic priorities. This packet is designed to help improve this process by giving students information, a perspective of the global scene, and guidance to develop critical analytical skills. Four activities are included: (1) "The Big Picture"; (2) "Global Alphabet Book"; (3) "Biosphere in a Jar"; and (4) "Mind Your Manor." Each contains a brief overview, a concept statement, objectives, a list of relevant subject areas and skills, a list of materials, and procedures used to carry out the activity. Some cut-out pages are included. (CW)

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CONSIDER THE CONNECTIONS

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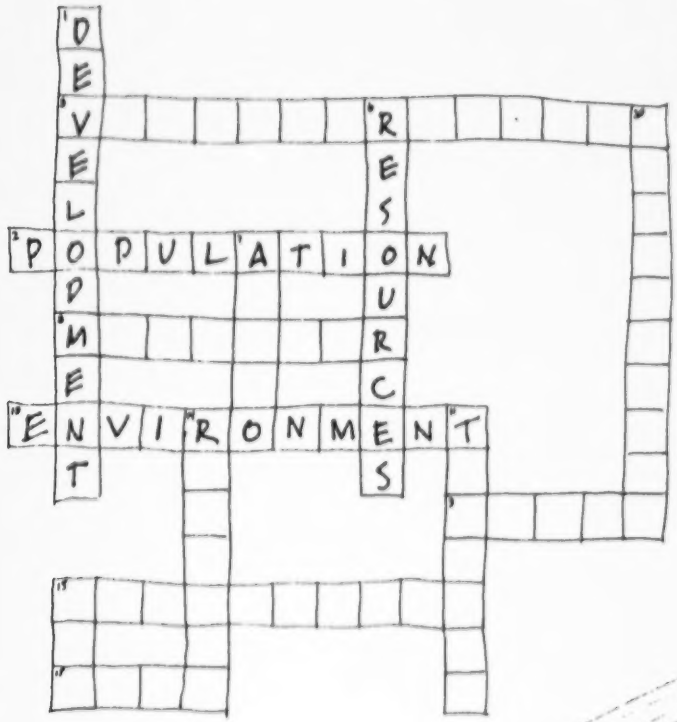

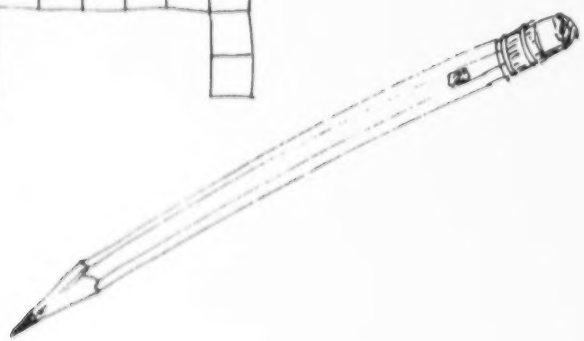

SE 049 207

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CONSIDER THE CONNECTIONS SUMMARY

When we look at pictures of Earth, as taken from the Apollo spaceship, it is like the first time a child looks in the mirror and realizes that the image is his or her own - not that of another person. This glimpse of ourselves on a blue planet alone in a sea of blackness reaffirms our connection to Earth and the other inhabitants sharing it. This shift in how we see the world is augmented by recent revolutions in the fields of technology, transportation, and communications, which globalize our daily activities and make our world appear accordingly "smaller." Through such connections, we can all reap the benefits of such developments as a global weather satellite system. We have only begun to realize that we also share the world's problems.

By themselves, the issues relating to an ever-growing world population, environmental degradation, unstable economic development and wasteful consumption of natural resources are complex and almost overwhelming. Until The Club of Rome analyzed how these issues may affect one another in The Limits to Growth, and The Global 2000 Report commissioned by former President Jimmy Carter forecast increasing stress on the planet due to the combined effects of these global trends, these issues had mostly been examined as purely national or regional problems, in isolation from one another. Yet in recent years, scientists, policy makers, special interest groups and business professionals have become aware that these issue areas are intricately interwoven and dynamically affect one another.

The following examples underline the fact that tackling one issue requires knowledge and consideration of many others:

* In 1980, there were 4.4 billion people on the earth; at least 1.3 billion additional people will populate the earth by the year 2000.
* 1.3 billion people already lack clean water and 1.7 billion lack adequate sanitation.
* In 15 years, there will be 60 cities of 5 million inhabitants or more - the majority will be in developing nations.
* Slash-and-burn techniques of shifting agriculture are responsible for at least 50% of deforestation worldwide.
* Nearly 80 million people live in areas threatened by imminent desertification.
* 8% of West Germany's forests have been destroyed by acid rain.
* If the production of chlorofluorocarbons continue to grow by as little as 2.5% annually, the ozone layer could be depleted by 26% by the year 2075.
* 1.5 billion people in the developing world derive at least 90% of their fuel requirements from wood products.
* Every year, more than 11 million hectares of tropical forests, an area larger than Austria, is lost. 40% have been cleared already.
* Over 40% of prescription drugs sold in the U.S. today contain chemicals derived from wild species of plants and animals, many dependent for survival on a tropical forest habitat.

It is necessary, then, to adapt. The old ways of doing things are no longer suitable to the conditions we face. The United States needs to provide stronger leadership for global responsibility, in our own national self-interest and in keeping with our world role. In order to achieve a sustainable future,through combining economic, environmental, and demographic priorities, nations must develop better foresight capability and long-range planning. Educators can help in this process by providing students with information, a well-rounded perspective of the global scene, and guidance to develop critical analytical skills.

THE BIG PICTURE

Students will collect pictures representing things that make life possible on Earth create a picture puzzle and discuss how all living things are connected to each other and to the Earth. (50 mins.)

CONCEPT:
All living things are dependent on a healthy world environment.

OBJECTIVES:
(1) Identify elements of life on Earth.
(2) Collect and order pictures.
(3) Compare complete and incomplete puzzle.

BACKGROUND: none

SUBJECT
- Art
- Natural Science

SKILLS
- gather
- identification
- order
- creativity
- interpretation

MATERIALS
- puzzle design*
- pictures
- blackboard
- contact paper
- glue
- knife
- scissors
- cardboard (8 1/2 X 11)

PREPARATION:
1. Instruct each student to bring in two picture magazines.

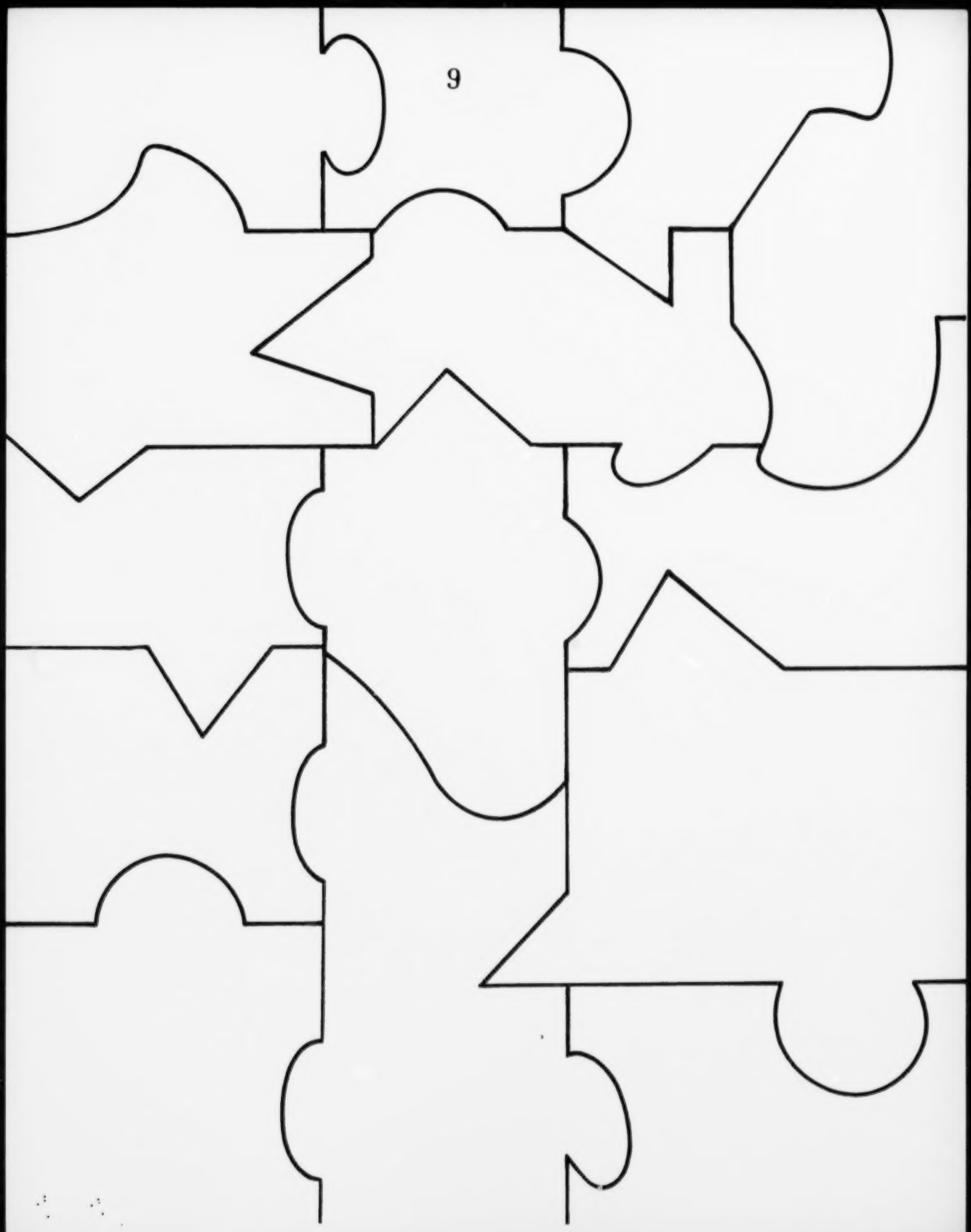
2. For each student, copy puzzle design and glue to back of each cardboard piece.

PROCEDURE:
1. Ask students what makes life possible planet Earth as distinct from other planets. Write their suggestions on the blackboard under the headings of "Living" and "Non-Living". Point out that land, air, water, and the sun are the main supports of life on Earth. Leave information on the board.

2. Instruct students to cut pictures out of the magazines, which represent living or non-living things, in order that they can make a picture puzzle representing life on Earth. Each student should have at least one picture of a living thing and the four non-living things.

3. Distribute the cardboard and glue. Students can create a montage by pasting their pictures onto the blank side of the cardboard. Allow to dry. Cover the montages with contact paper, then cut the puzzle pieces by following the lines on the back. Return the pieces and have the students rebuild their puzzles.

CONCLUSION:
1. Ask the students to remove one or two piece of their puzzle, which represents planet Earth. How might these changes affect the other things in their puzzle? For example, the removal of water might denote the loss of crop production. Compare their observations to actual events (i.e. African famine).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GLOBAL ALPHABET BOOK

Students will fill in the blanks with a vocabulary word that begins with a letter of the alphabet and use the pages to construct a Global Alphabet Book.

CONCEPT:
Global issues and choices are coming ever closer to our individual lives.

OBJECTIVES:
(1) Identify vocabulary words.
(2) Order the pages into a book.

BACKGROUND: See "The Big Picture."

SUBJECT	SKILLS
• Language	• definition
• Art	• identification

MATERIALS
• stapler • scissors • crayons
• Alphabet Book pages*

PREPARATION:
1. Copy the Alphabet Book pages.

PROCEDURE:
1. Introduce activity as a way of learning about words or ideas that have global meaning.

2. Pass out the Alphabet Book pages and allow students to work on them individually. The following words are used:

air	nonrenewable
birds	ozone
conservation	people
development	quiet
energy	recycling
forest	species
GAIA	talking
habitat	understanding
interdependence	vote
jaguar	water
knowing	"x"
land	you
manage	zoo

3. After the students have worked on filling in the vocabulary words, identify and define each of the words with the students. Students can fill in the blanks with the correct word.

4. Each student can then draw a picture to represent the word in the circle. To create a book, cut along the dotted line on each page and then staple pages together in order. The students may want to create a cover for their book also.

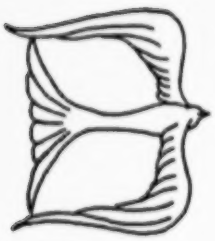
CONCLUSION:
1. Ask students to think about one way that the global environment affects their own lives. Each student should be able to think of one way without repeating another student's answer.

is for ___

The stuff you can't see;
Let's all keep it clean,
'Cause we need it to breathe.

<CUT HERE>

D
S
R
I
B



is for _ _ _ _ _

Who fly south to the tropics.
What we call it migration
Is their winter vacation.

<CUT HERE>

OCSVITNORAEN

is for _ _ _

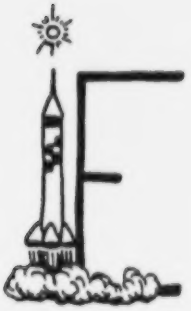
L M E E P N D T V O E

is for _ _ _ _ _ _ _ _ -
_ _ _ _

How people change the land.
Have we done all we could
To sort the bad from the good?

<CUT HERE>

YEGREN



is for _ _ _ _ _ _ _

From gas, coal, oil and sun.
It powers our work
To get the job done.

<CUT HERE>

T O R E S F S

is for _ _ _ _ _ _ _ _

With green trees straight and tall.
They give us wood, food and air
And homes for animals, big and small.

<CUT HERE>

13

AIGA

A Greek name for Mother Earth.
She can be sick or well.
Are we caring? Time will tell.

<CUT HERE>

is for _ _ _ _ _ _ _ _

An animal's home with food, water, and room to roam.
If we destroy it without a care,
The animals soon will not be there.

<CUT HERE>

E I T E C R P D

D N E E N N E

is for _ _ _ _ _ _ _ _ -
_ _ _ _ _ _ _ _ _

A long word at best.
It means all working together
With each needing the rest.

<CUT HERE>

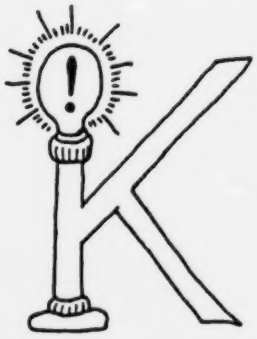
UGJRAU

is for _ _ _ _ _ _

A spotted jungle cat.
She catches food live
But needs the forest to survive.

<CUT HERE>

IGNWKON



is for _ _ _ _ _ _ _ _

That the world is round,
With birds in the sky
And people on the ground.

<CUT HERE>

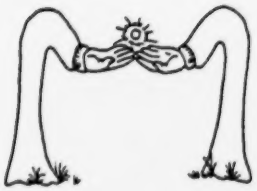
NALD

is for _ _ _ _ _

Where we grow our food.
What could we say?
If it all washed away?

<CUT HERE>

MGEATNNMEA

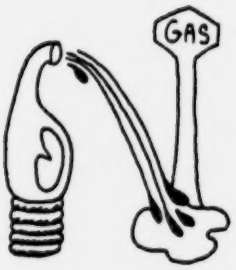


is for _ _ _ _ _ _ _ _ _ _ _

Of the Earth's great resources,
Not just for today and only for some,
But shared for us all for many years to come.

<CUT HERE>

LRAWBONENEN



is for _

Like oil, gas, and coal.
When we use them up,
All that's left is the hole.

<CUT HERE>

21

E
O
N
Z
O

is for _ _ _ _ _ _

A shield to the sun.
It helps us stay healthy
As we play and have fun.

<CUT HERE>

22

LOPEPE

is for _ _ _ _ _ _ _

Just like you and me.
With five billion now and more every year,
Where we'll all live is not very clear.

<CUT HERE>

EIGHT

is for _ _ _ _ _ _

With the moon at night.
While on the other side,
The sun shines bright.

<CUT HERE>

IYLECRECNG

is for _ _ _ _ _ _ _ _ _ _ _

It's living a new way,
Saving bottles, cans and papers - -
And it really does pay.

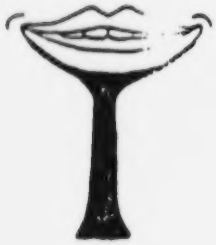
<CUT HERE>

ISEPCSE

is for _ _ _ _ _ _ _ _

Every living thing.
We all share the Earth
Whether we wade, swim, or sing.

<CUT HERE>



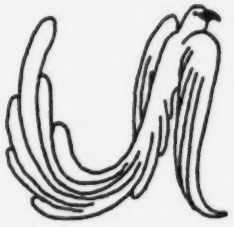
is for _ _ _ _ _ _ _ _

In different languages, its true.
Still, we all live on Earth,
And that includes <u>you</u>!

<CUT HERE>

27

DTURIESGNDNAN



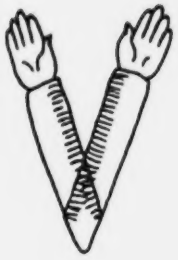
is for _____

_____

The world that we share.
We can make it better
With knowledge and care.

<CUT HERE>

T O E V



is for _ _ _ _

The time of our choice.
On issues that concern us,
We do have a voice.

<CUT HERE>

TRAEW

Covering three-fourths of the globe.
A planet of blue is what you'd see,
If you could fly in space with me.

<CUT HERE>

30

X

is for __

To mark the exact place.
You live with your family --
The whole human race.

<CUT HERE>

O
Y
U

is for _ _ _

The children of today.
The future of tomorrow
Depends on what you say.

<CUT HERE>

32

OZO

is for _ _ _

Where some animals live.
If we all share the Earth,
We must both take and give.

<CUT HERE>

BIOSPHERE IN A JAR

Students will create an Earth "biosphere" in a jar, document the changing conditions, and compare their biosphere to planet Earth.

CONCEPT:
The balance between populations, resource consumption, and the quality of the environment leads to sustainable existence.

OBJECTIVES:
(1) Define biosphere.
(2) Identify 5 elements of life.
(3) Document observations of experiment.
(4) Define sustainable.

BACKGROUND: See "The Big Picture."

SUBJECT
- Natural Science

MATERIALS
- glass jars w/lids
- biosphere material

SKILLS
- scientific inquiry
- observation
- comparison
- comparison
- analyzing

PREPARATION;
1. Each student should bring a medium or large glass jar to class.

2. Collect the biosphere material from a swamp or irrigation ditch, or make your own combination using water, plant material, small crustacea, mud or sand. Bring the material to the classroom or arrange a short field trip for your students to collect their own material.

PROCEDURE:
1. Define the Earth as a biosphere - an interdependent system, which is self-adjusting and self-balancing. Explain that each student or groups of students will be creating their own Earth biosphere in a jar and monitoring the changes.

2. Brainstorm with the students and write on the blackboard the basic elements necessary for life on the Earth. [air, water, food, energy (sun) and space]

3. Students can now create their own biospheres by adding the necessary ingredients to their jar. Students can work in groups, partners or individually. Place the jars on a window ledge or near some light source.

4. Students should keep a journal and record the changes in their biosphere every other day for a one month period.

Note: Depending on the mix of ingredients in the biosphere jars, changes may occur quickly or slowly and each jar will exhibit different changes. Use this on-going classroom experiment as an opportunity for "teachable moments." Allow the changes to prompt students' questions and class discussions about what may have caused certain changes and what <u>might</u> occur because of those changes?

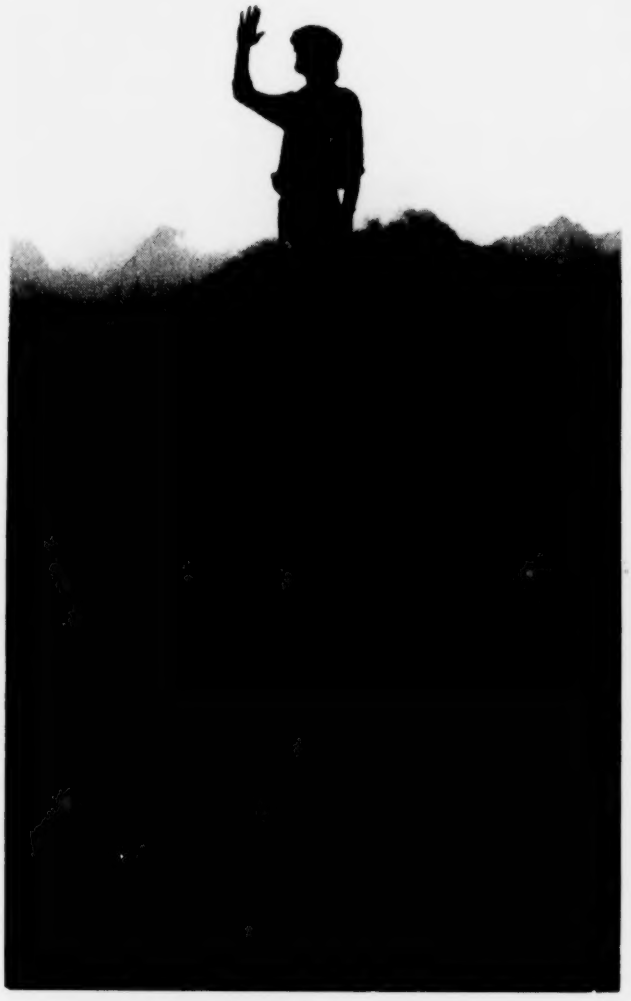
BIOSPHERE IN A JAR con't.

CONCLUSION:

1. Keep a few biosphere jars aside for specific tests. Place a dark cloth over one jar for 3-4 days. Compare results to the scenario of a "nuclear winter." Swirl the mud around in another jar as if volcanic ash was covering the Earth. What are the results? Ask students about other experiments the class can conduct.

2. Point out that the changes occurring in the jars are part of the self-regulating process of the biosphere. If a population of crustacea becomes too large and consumes all the available resources, what are the results? Define the steady-state or balanced condition, which the surviving biospheres will eventually reach as sustainable. Compare biosphere jars to planet Earth. How can a growing world population and limited resources affect the sustainability of life on Earth?

+ Read the following poem to the students or have them share in reading it. It was written by American astronaut Russell Schweickart as he was circling the Earth in a spaceship. What is Mr. Schweikart telling us from his experience?



Up there you go around each hour and a half,
Time after time - you wake up over the Mid-East, over North America
As you eat breakfast you look out - and there is the Mediterranean Area -
And you go down across Africa and out over the Indian Ocean and look up at that great sub-continent of India - and then you look for those friendly things: Los Angeles and Phoenix.

You can't imagine how many borders and boundaries you crossed - and you don't even see them - you know there are millions of people quarreling with each other over some imaginary line that you can't see From where you see it, the thing is whole, and it is so beautiful. And you wish you could take one from each side in hand and say, "Look at it from this perspective. Look at that. Let's share our ideas and information."

The bright blue and white Christmas tree ornament in that black sky, that infinite universe, really comes through - it becomes so small and so fragile, in such a precious little spot in the universe, that you can block it out with your thumb and you realize that on that small spot,
that little blue and white thing, is everything that means everything to you.
All of history and music and poetry and art and war and death and birth and love, tears, natural and human resources, all of it is in that little spot out there that you can cover with your thumb.

MIND YOUR MANOR

Students will act as tenants of Earthly Manor, an apartment house, to demonstrate the interdependence of the world and then write an essay on individual responsibility for our global future. (50 mins.)

CONCEPT:
A sustainable global future requires individual responsibility and planning with foresight.

OBJECTIVES:
(1) Identify the continents.
(2) Define foresight.
(3) Write a one-page essay describing individual actions representing foresight and planning.

BACKGROUND: See "The Big Picture" and "Biosphere in a Jar."

SUBJECT	SKILLS
• Geography	• identification
• English	• comparison
• Social Science	• application

MATERIALS

• string or tape	• globe
• colored paper	• paper
• scissors	• pens/pencils
• Earthly Manor Information Cards*	

PREPARATION:
1. Locate a wide staircase, gymnasium bleacher or auditorium - anyplace where the students can sit in elevated rows. With string or tape, mark off 6-8 ft. on 5 consecutive rows. With different colors of paper, label the bottom row "Africa", the next row "Asia", the next row "Latin America", the next row "Middle East" and the top row "North America, Europe and Japan."

2. Copy and cut the Earthly Manor Information Cards.

3. Based on the exact number of students in your class, calculate how many colored pieces of paper you will need, which should match the color of the signs denoting the continents, in order to arrange the students into a pyramid shape.

For example:

blue	X	Europe, etc.
red	XXX	Middle East
yellow	XXXXX	Latin Am.
green	XXXXXXX	Asia
white	XXXXXXXXX	Africa

Place the colored pieces into a container.

PROCEDURE:
1. Hold up a globe in front of the class. Ask the students to name the continents. Point out that the different continents all are connected on planet Earth. Tell the students to imagine the Earth floating in space - a big, blue ball. Gradually, begin to reshape the sphere in your mind into the familiar rectangular shape of an apartment building with five stories.

2. Welcome the students to Earthly Manor inform the students that they are all tenants of this five story apartment building, but live on different floors. Allow the students to pick one colored piece of paper and to sit in the row with the matching colored sign.

3. Once they are all in place, identify which continents are represented by the different rows. Then distribute the Earthly Manor Information Cards to student volunteers. They will begin reading them in numerical order, after you finish speaking.

4. Begin reading the following scenario:

"Hello, my name is Razal and I'm an extra-terrestial being. I am looking for a place to live. I heard about your apartment building, Earthly Manor, from some folks at Cosmic Condominiums over in the next galaxy. They told me that in Earthly Manor, no one owns this building and that you all share the resources. I have come to learn more about this place, Earthly Manor."

MIND YOUR MANOR con't.

5. After the discussion, ask the students how they feel about their position in the apartment building. Is this scenario an accurate description of the world in 1986? Ask the students to consider whether conditions in the apartment house will get <u>better</u> or <u>worse</u> in the future? How and why?

CONCLUSION:

1. Remind the students that in the apartment house, there must be individual responsibility for the collective good of all. People take responsibility for themselves, their families and their futures all the time. Ask students to give examples of personal action today for a better future tomorrow, e.g. saving money in a bank for college, recarpeting the house, etc. That type of action requires thinking ahead and planning.

2. Define foresight. Give examples. e.g. Trees are being planted in Africa to help control the erosion of the soil so crops can be grown to help feed the people.

+ Have students fill out a "pledge card" describing their <u>personal</u> action contributing to the future well-being of planet Earth. Or encourage the class to decide on a <u>collective</u> pledge.

1

The roof of Earthly Manor is made of ozone, the best material known to man for shielding us from the harmful rays of the sun.

2

Our oxygen supply and other atmospheric gases are stored underneath the ozone - in the attic.

3

Each human living in Earthly Manor consumes 1,000 quarts of atmospheric gas per hour in order to survive.

4

Originally, the oxygen comes from the basement or foundation of the building, which is supported by a mixture of topsoil, forests, rangeland, and minerals.

5

Our plumbing system runs throughout Earthly Manor - the water may be used by one tenant, then recycled and used by another.

6

We are only rationed to use 1% of the water available in the plumbing system as 97% is salt water and 2% is frozen in the pipes.

7

Earthly Manor has five floors. The apartments on the ground floor are overcrowded and poorly furnished - the top floors contain penthouses.

8

It doesn't make much difference what color our neighbors are, where they were born, or how they vote. What concerns us the most is whether the other tenants keep their apartments in good repair, or let them run down, whether they help make the building a safe and pleasant place to live, or cause problems for our family; and whether they respect our privacy.